IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.	:	**10/708,068**
Inventor	:	**KOERNER, Scott A. et al.**
Title	:	**"Engine Mounted Fault Indicators"**
Filing Date	:	**February 6, 2004**
Art Unit	:	**3747**
Examiner	:	**KWON, John**
Confirmation No.	:	**2067**
Our File No.	:	**1057143**

DECLARATION UNDER 37 C.F.R. §1.132
OF
MARK SKRZYPCHAK

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Mark Skrzypchak, residing at 3606 107th Street, Pleasant Prairie, WI, state the following:

Personal Information

1. I am an employee of BRP U.S. Inc. ("BRP U.S."), a subsidiary of Bombardier Recreational Products Inc., the assignee of the above-identified application. BRP U.S. designs, manufactures and sells marine outboard engines.

2. I have been employed at BRP U.S., and its predecessors in title Outboard Marine Corporation and Bombardier Motor Corporation of America, since November 1981, during which time my responsibilities have included the design and development of electronics for outboard engines, such as capacitative discharge and inductive ignition systems, as well as starter validation and failure analysis.

3. I have read and understood the above-identified application, including the pending claims.

4. I have read and understood the November 15, 2007 Office Action issued in the above-identified application, including Koerner (U.S. Patent 6,820,584) and Bouse (U.S. Patent Application Publication No. 2004/0019461), the patent documents applied against the claims.

Start-up Mode and Running Mode

5. Claims 18 and 38 of the above-identified application recite providing "at least one form of feedback to a user regarding at least an operational condition at engine start-up."

6. Referring generally to the above-identified application, I understand that during normal operation an engine operates first in a start-up mode and subsequently in a running mode, both of which will be described below. In some situations, an engine fault may occur during engine start-up that may prevent the engine from entering the running mode. I understand the expression "engine start-up" to refer to the period of time during which the engine is operating in the start-up mode, prior to entering the running mode.

7. The start-up mode of an engine is initiated when an operator first attempts to start the engine. Several methods of attempting to start an engine are known including: inserting and turning an ignition key; pulling a rope starter; or actuating a keyless ignition system or a remote starter system. The method used to attempt to start the engine varies according to the configuration of the particular engine and the vehicle in which it is used, and I understand that any other known method may be used to initiate the start-up mode.

8. As I understand it, the start-up mode continues either until the engine enters the running mode, or until the operator stops attempting to start the engine, for example if the engine will not start properly. The start-up mode typically includes the first few cranks (revolutions) of the engine, which are externally powered, for example by either a rope starter or a starter motor, before the engine produces enough power to sustain its own operation.

9. The running mode of an engine is characterized primarily by the combustion of fuel in the combustion chamber(s) of the engine producing sufficient power to maintain the engine running at its idle speed. During the running mode, the engine typically produces sufficient additional power to drive a load, such as a vehicle, a generator or factory machinery. The engine also produces sufficient additional power to drive various systems related to the engine, such as one or more oil pumps. The added load may require the engine to operate at a higher speed than its idle speed. I understand this to be within the definition of "running mode", because the engine is producing sufficient power to sustain its operation.

10. A person familiar with the running of an engine can readily determine whether the engine is running at idle speed, and therefore whether the engine has entered the running mode. Even a person not skilled in engine ignition systems can determine when an engine has entered the running mode. For example, when the driver of a car wishes to start the car, he turns the ignition key to the crank position to initiate engine start-up. The driver later releases the key from the crank position when the engine has entered the running mode, at which point the engine can run without assistance from the starter. The driver typically determines that the engine has entered the running mode without any technical knowledge about the engine, by observing either the sound of the engine running at idle speed or the rotation speed indicated by the tachometer if the vehicle is so equipped.

11. The rotational speed of the engine also allows a determination of when an engine has transitioned from the start-up mode to the running mode. This is useful, for example, so that engines equipped with electronic or automatic starters can discontinue the forced cranking of the engine once the engine has entered the running mode.

12. Attached hereto and marked as **Exhibit A** is a schematic graph of the rotational speed of an engine (in revolutions per minute or RPM) as a function of time, during normal engine operation. The engine is initially at zero RPM. When engine start-up is initiated, the RPM increases from zero up to a peak value known as the flare RPM. At the flare RPM, the engine transitions from the start-up mode to the running mode. Upon entering the running mode, the engine speed decreases from the flare RPM to the idle RPM of the engine, which is lower than the flare RPM. The engine speed then remains stable at the idle speed until either the engine is turned off or the engine is caused to operate at a higher speed, for example to power a load.

13. While the exact values of the flare RPM and the idle RPM are different for different engines, both values can be easily determined for any particular engine. The flare RPM can be determined from the peak RPM during normal engine start-up, and the idle RPM can easily be determined by observing the engine during steady state operation.

The Koerner Patent, US 6,820,584

14. Referring to lines 55-60 of column 3 of Koerner, "[a]djusting the width or frequency of the modulated signal, or duty cycle of an oil injector, permits increasing or decreasing of the quantity of oil delivered to each of the engine cylinders and can reduce the occurrence of low oil pressure conditions during engine operation." I understand this to mean that Koerner

monitors the oil pressure of the engine 12 during engine operation, i.e. when the engine 12 is in a running mode.

15. Referring now to lines 21-28 of column 4 of Koerner, "[t]he ECU receives oil pressure indicative signals from the pressure sensor 38 to detect oil pressure, such as a low oil pressure condition. For each signal, the ECU 22 monitors the oil pressure indicative signal and determines therefrom if the oil injector 34 is delivering oil properly. Once a low oil pressure condition is detected, the ECU 22 can transmit a fault signal to a warning system 40 to indicate the occurrence of a low oil pressure condition, for example. The warning system 40 is preferably configured to at least notify an operator and/or technician of the low oil pressure condition indicating oil flow through the distribution manifold 44 is malfunctioning." I understand this to mean that the ECU 22 of Koerner transmits a fault signal warning system 40 when a malfunction in the distribution manifold 44 is detected, resulting in a low oil pressure condition. I also understand that oil is supplied to the distribution manifold 44 by a mechanical oil pump 36 that is powered by the engine 12. As such, I understand that the distribution manifold 44 operates only during a running mode of the engine 12.

16. Referring now to lines 45-50 of column 5 of Koerner, "the engine is monitored to determine instantaneous operating parameters 101. These operational parameters may include engine and ambient temperatures, engine speed or RPM, battery voltage, and/or load on the engine. By determining parameters of operation, a time for next oil pulse can be ascertained at 102." Referring also to Figure 4, the engine parameters of Koerner are monitored on a regular basis at step 101. The operating parameters monitored by Koerner are usually characteristic of an engine in a running mode. As I understand it, these engine parameters typically would not be monitored when an engine is in the start-up mode. As such, I understand Koerner to monitor the engine 12 during a running mode and not during engine start-up.

The Bouse Patent Publication, US 2004/0019461

17. Referring to paragraph [0036] of Bouse, "the diagnostic unit 44 or 88 is preferably configured to operate substantially continuously during operation of the rotating equipment to detect conditions associated with the rotating equipment, that is to operate continuously or on a periodic time frame with a small interval, e.g., once every minute or couple of minutes." The diagnostic unit 44 of Bouse receives signals from the sensors 46 during operation of the

equipment in the plant 10, and detects conditions associated with the continued running of the rotating equipment. As such, the motor 206 of Bouse is producing sufficient power to maintain the rotating equipment of Bouse in continued operation, which indicates that the motor 206 is in a running mode. Therefore, Bouse provides feedback regarding an operational condition during a running mode and not at engine start-up.

18. I hereby declare that all statements made herein of my knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statement and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statement may jeopardize the validity of the application or any patents issued from them.

BY: _____

Mark Skrzypchak

Date: 2/12/09